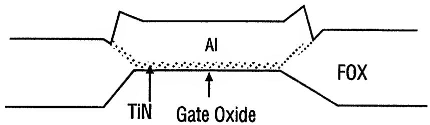
Al
FOX
TiN
Gate Oxide

FIG. 1

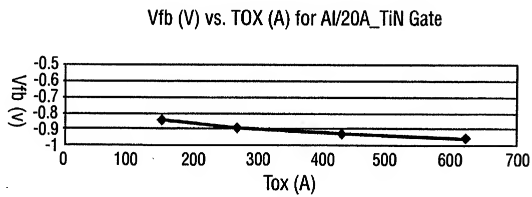
Vfb (V) vs. TOX (A) for Al/20A_TiN Gate
Vfb (v)
-0.5
-0.6
-0.7
-0.8
-0.9
-1
0
100
200
300
400
500
600
700
Tox (A)

FIG. 2

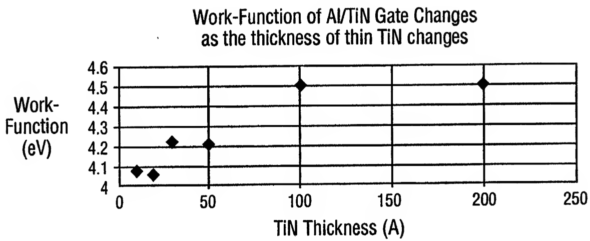
Work-Function of Al/TiN Gate Changes as the thickness of thin TiN changes
Work-Function (eV)
4.6
4.5
4.4
4.3
4.2
4.1
4
0
50
100
150
200
250
TiN Thickness (A)

FIG. 3

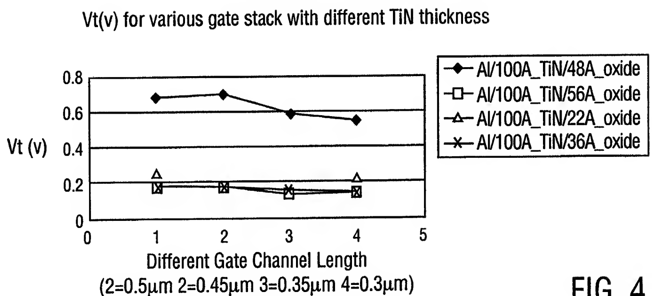
Vt(v) for various gate stack with different TiN thickness
Vt (v)
0.8
0.6
0.4
0.2
0
0
1
2
3
4
5
Different Gate Channel Length
(2=0.5μm 2=0.45μm 3=0.35μm 4=0.3μm)
Al/100A_TiN/48A_oxide
Al/100A_TiN/56A_oxide
Al/100A_TiN/22A_oxide
Al/100A_TiN/36A_oxide

FIG. 4

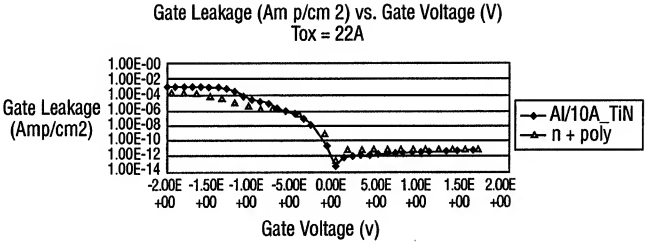
Gate Leakage (Am p/cm 2) vs. Gate Voltage (V)
Tox = 22A
Gate Leakage (Amp/cm2)
1.00E-00
1.00E-02
1.00E-04
1.00E-06
1.00E-08
1.00E-10
1.00E-12
1.00E-14
-2.00E +00
-1.50E +00
-1.00E +00
-5.00E +00
0.00E +00
5.00E +00
1.00E +00
1.50E +00
2.00E +00
Gate Voltage (v)
Al/10A_TiN
n + poly

FIG. 5

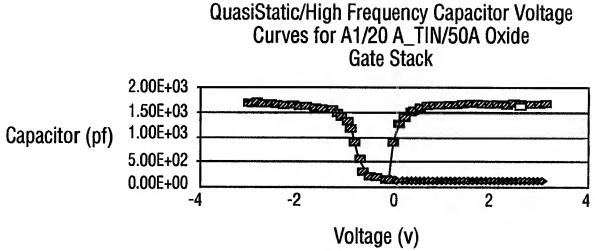
QuasiStatic/High Frequency Capacitor Voltage Curves for A1/20 A_TIN/50A Oxide Gate Stack
Capacitor (pf)
2.00E+03
1.50E+03
1.00E+03
5.00E+02
0.00E+00
-4
-2
0
2
4
Voltage (v)

FIG. 6

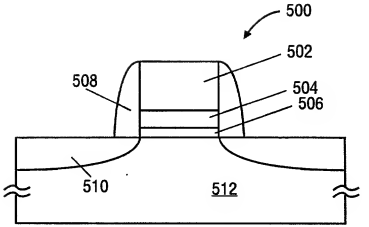
500
502
508
504
506
510
512

FIG. 7

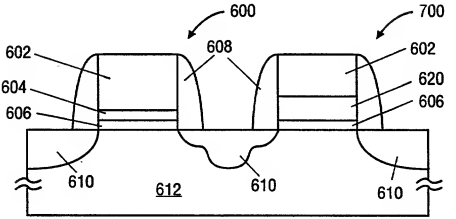
600
700
602
608
602
604
620
606
606
610
612
610
610

FIG. 8